UNITED STATES ENVIRONMENTAL PROTECTION AGEI
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

EPA Region 5 Records Ctr.
239345

APR 1 0 1996

REPLY TO THE ATTENTION OF

MEMORANDUM

SUBJECT: ACTION MEMORANDUM - Request for a Time-Critical Removal Action at the Union Lake Site, Union Lake, Oakland County, Michigan (Site ID #OL)

FROM: for P.C. Lall, On-Scene Coordinator Frank Rollins
Emergency and Enforcement Response Branch - Section 1

TO: Jodi Traub, Associate Division Director
Office of Superfund

THRU: for Richard Karl, Chief Donald Rumer
Emergency and Enforcement Response Branch

I. PURPOSE

The purpose of this memorandum is to request and document your approval to expend up to $88,000 to mitigate threats to human health and the environment posed by the presence of radioactive materials (thorium, radium, and americium) in the structures and soils at the shed at [redacted]nion Lake, Michigan, as well as two other locations in Clinton Township where the source materials have been carried by a high school student.

A 17-year-old boy extracted, carried out experiments and stored radioactive materials in the shed at the Union Lake house where his mother and mother's friend live. The boy also transported some of these materials in his car and used some of them at his residence with his father and step-mother at [redacted] Clinton Township, Michigan. Some source materials confiscated by Clinton Township Police from the boy's car (in an unrelated police investigation) are stored at the Clinton Township Police Station awaiting proper disposal by the United States Environmental Protection Agency (U.S. EPA). The removal action proposed herein seeks to abate the release of gamma rays, radon, and alpha particles by removing radium, thorium, and americium sources as well as contaminated building materials, structures, and soils. It is estimated that the removal action will require 10 on-site working days to complete.

This site is not on the National Priorities List.

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II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID # MI0001091214

The Union Lake Radiation (ULR) site is located at [redacted], Union Lake, Oakland County, Michigan. The site consists of a storage shed in a residential subdivision and is bordered in all directions by residences.

On August 30, 1994, a 17-year-old boy, who resides at the home of his father and step-mother at [redacted] Clinton Township, Michigan, was detained by the Clinton Township Police. While searching the car, police discovered materials stored in a locked tool box that the boy reported to be radioactive. On August 31, 1994, the Michigan Department of Public Health (MDPH) was contacted by Clinton Township Police to verify the information provided them by the boy. After MDPH verified the items to be radioactive, police locked them in a metal storage building detached from the station building. Among items removed from the car by police were numerous foil cubes containing a radioactive gray powder, a package of small disks, cylindrical metallic objects, mercury switches, and small packages wrapped in duct tape and aluminum foil. MDPH notified the U.S. Nuclear Regulatory Commission (NRC), Region III, of the incident on August 31, 1994.

During subsequent interviews with the boy, MDPH learned that he had been conducting chemical experiments with radioactive materials in a wooden shed at the home of his mother, Patricia Hahn, at [redacted] Union Lake, Michigan. Mike Polasek, who also resides there, is the owner of the house. According to the boy, the experiments included burning of and attempted concentration of radioisotopes of thorium which is present in lantern mantles. He also reported concentrating radium from various luminescent sources, including clock dials. Miscellaneous other materials, including natural ores containing radionuclides, were also reported to have been utilized in the experiments.

On November 29, 1994, MDPH conducted a radiological survey at the Polasek residence in Union Lake. Their findings concluded that the shed at the Union Lake location and many items stored in the shed were contaminated with radioactive materials.

MDPH formally requested U.S. EPA's assistance via a letter dated December 20, 1994, to the Chief of the Emergency and Enforcement Response Branch (EERB), Mr. Richard Karl. As a result, EERB,

Response Section 1, conducted a site assessment on January 25, 1995. The results of the radiation survey are included in Table 1. Some containers of chemicals have been identified as well. The proposed cleanup activities described in this Action Memorandum have been discussed with David Minnaar of the MDPH, Division of Radiological Health.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the ULR site present an imminent and substantial endangerment to public health or welfare or the environment based upon factors set forth in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 CFR 330.415(b)(2). These factors include:

- o Actual or potential exposure to nearby human populations, animals, or food chain from hazardous substances or pollutants or contaminants;

The MDPH, Radiological Health Division, identified radioactive source materials estimated at 5 to 8 percent by weight thorium. Excessive levels of americium-241 and thorium-232 have been documented at the self-made laboratory (shed) on the residential property. Radium 226 and natural uranium are also suspected. These materials are all hazardous substances for the purposes of CERCLA 101(14). Several other radioactive material sources confiscated during the initial incident response remain in the police custody pending disposal. The boy is reported to have conducted experiments with radioactive materials for at least 4 years.

The shed is located in a backyard along a fence adjacent to another residence. Also observed in the yard of the neighboring property to the north was a playground set suggesting that small children reside there.

Thorium, a naturally occurring element, most commonly present as the radioisotope thorium-232, can enter the body through ingestion, inhalation, or skin contact. According to the Agency for Toxic Substances and Disease Registry's (ATSDR) Toxicological Profile for Thorium, studies have demonstrated that breathing thorium dust may increase the chances of an individual's developing lung disease and cancer of the lung or pancreas. Exposure to thorium-containing compounds has also been documented to have caused chromosomal changes in humans. Once in the body, most thorium is eliminated in the feces or urine. However, a portion of the thorium may be deposited in bone tissue and remain there for many years. Additionally, thorium is acutely toxic by ingestion.

Table 1. CONTAMINATED ITEMS FROM SHED
UNION LAKE RADIATION

January 25, 1995

Item Screened	Instrument Readings in cpm	Comments
small white rock	80	-
black spot on concrete chunk	300	-
triangular concrete chunk	220	-
pickle jar	160	-
foil package of gray solid	180	-
steel scouring pad	100	-
Yellow plastic bag: paper scrap paper scrap duct tape scrap metal chunk copper bowl screwdriver	 1,500 3,000 500 700 6,000 600	Copper bowl gave readings of 80 μR/hr using a 1 X 1 NaI probe.
wire rack #1	40	-
wire rack #2	100	-
green propane cylinder (black spot)	700	-
square aluminum pan lid	120	-
black, gray dust in Gilbey's Vodka box	90	-
galvanized metal strip	80	-
large sheet of lead	250	Gas proportional alpha detector reading of 319 c/20s/100cm^2

Table 1. (continued) CONTAMINATED ITEMS FROM SHED UNION LAKE RADIATION

January 25, 1995

Item Screened	Instrument Readings in cpm	Comments
air conditioner (front)	80	Gas proportional alpha detector reading of 161 c/20s/100cm²
multi-colored cloth	100	-
filter paper	190	-
aluminum pie pan w/ashes	50	-
small black trash can: newspaper filter paper #1 filter paper #2 rocks general trash glycerin bottle	 100 120 160 BKG 100 60	-
black spot on floor in west doorway of shed	1,600	Gas proportional alpha detector reading of 203 c/20s/100cm²
gold carpet on floor (west end)	160	-
broken Pyrex measuring cup	400	-
metal vegetable can	50,000	-
orange milk crate (bottom)	300	-
black clumped solid on floor at west end	200	-
black clumped solid on floor at west end	1,500	-

Table 1. (continued)

CONTAMINATED ITEMS FROM SHED
UNION LAKE RADIATION

January 25, 1995

Item Screened	Instrument Readings in cpm	Comments
roof shingle on floor at west end	600	-
west end floor - corner	200	-
shelf on west wall	120	-
red cloth	140	-
1.5' X 2' piece drywall	NS	Gas proportional alpha detector reading of 265 c/20s/100cm²

* Instrument readings taken with Ludlum Model 3 meter with Ludlum 44-40 shielded G-M pancake probe unless otherwise noted.

cpm = counts per minute

c/20s/100 cm² = counts per 20 seconds per 100 square centimeters

BKG = background levels

- = no comments

NS = not surveyed with G-M pancake probe; see comment

Radium is also a naturally occurring radionuclide that can be found in the environment at low concentrations. However, according to ATSDR's Toxicological Profile for Radium, exposure to radium at high levels can cause anemia, cataracts, fractured teeth, cancer, and death in humans.

- o Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

Wind and rain could cause release and/or migration of the americium and thorium and possibly radium and uranium. This migration would pose a health threat to residents [redacted] and their neighbors to the north. Other hazardous materials found on site also need to be disposed of.

- o The availability of other appropriate Federal or State response mechanisms to respond to the release;

This factor supports the actions at the site as proposed in this memorandum because MDPH does not have the necessary resources to respond to this time-critical situation. Furthermore, in the State of Michigan, the MDPH is the lead agency for any radiological matters.

IV. ENDANGERMENT DETERMINATION

The current site conditions pose a serious threat to human health and the environment through direct contact, inhalation and ingestion. The actual or threatened release of these hazardous substances, if not addressed by implementing the response actions proposed in this Action Memorandum, may present an imminent and substantial endangerment to public health or welfare or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

The following activities are proposed:

1) Develop and implement a site Health and Safety Plan and site Security Plan;

2) Develop and implement an air monitoring program;

3) Delineate the extent of contamination;

4) Remove, package and dispose of all radium, thorium, and americium sources, contaminated structures and soils, including the items recovered from the Hahn residence in Clinton Township as well as from the Clinton Township Police Station;

5) Dispose of all characterized or identified hazardous substances, pollutants, or contaminants at RCRA/CERCLA-approved facilities in accordance with the U.S. EPA off-site policy.

Removal activities will require approximately 10 on-site working days to complete. The threats posed by the contamination on site and other impacted locations meet the criteria listed in Section 300.415(b)(2) of the NCP.

The On-Scene Coordinator (OSC) has begun planning for the provisions of post-removal site control, consistent with the provisions of Section 300.415(k) of the NCP. However, the nature of this removal will minimize the need for post-removal site control. The detailed cleanup contractor costs are presented in Attachment 1 and estimated project costs are summarized below:

REMOVAL PROJECT CEILING ESTIMATE

EXTRAMURAL COSTS:	
Cleanup Contractor	$35,200
Contingency (20%)	7,050
Subtotal	$42,250
Total TAT, including multiplier costs	23,000
Extramural Subtotal	$65,250
Extramural Contingency (20%)	13,050
TOTAL, EXTRAMURAL COSTS	$78,300
INTRAMURAL COSTS:	
U.S. EPA Direct Cost [$30x(100 Reg. hrs+10 HQ hrs]	$ 3,300
U.S. EPA Indirect Costs ($64x100 Reg. hrs)	6,400
TOTAL, INTRAMURAL COSTS	$ 9,700
TOTAL REMOVAL PROJECT CEILING	$88,000

The response actions described in this Action Memorandum directly address actual or threatened releases of hazardous substances, pollutants or contaminants at the facility which may pose an imminent and substantial endangerment to public health and safety and to the environment. These response actions do not impose a burden on affected property disproportionate to the extent to

which that property contributes to the conditions being addressed.

Applicable or Relevant and Appropriate Requirements (ARARs)

All applicable or relevant and appropriate requirements (ARARs) of Federal law will be complied with to the extent practicable. A letter has been sent to Mr. George W. Bruchmann, Chief, Radiological Health Division, MDPH, requesting that he identify State ARARs. Any State ARARs identified in a timely manner for this removal action will be complied with to the extent practicable.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Conditions at the site, if not addressed or if action is delayed, could lead to increased health risks to the entire community. The chances of exposure to gamma radiation and of ingestion of alpha particles are high if the public comes in contact with the materials. The confiscated materials are being stored at the Clinton Township Police Station and are awaiting packaging and disposal.

VII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues associated with this site.

VIII. ENFORCEMENT

For administrative purposes, information concerning confidential enforcement strategy for this site is contained in the Enforcement Confidential Addendum.

IX. RECOMMENDATIONS

This decision document represents the selected removal action for the Union Lake Radiation site located in Union Lake, Oakland County, Michigan, developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the Administrative record for the site. Conditions at the site meet the NCP Section 300.415(b)(2) criteria for a removal and I recommend your approval of this proposed removal action. The total project ceiling, if approved, will be $88,000. Of this, an estimated $55,300 may be used for cleanup contractor costs. You may indicate your decision by signing below.

APPROVAL: _____ **DATE:** 4/10/95
Associate Division Director
Office of Superfund

DISAPPROVAL: _____ **DATE:** _____
Associate Division Director
Office of Superfund

Confidential Enforcement Addendum
Attachments
1. Cleanup Contractor Cost Estimate
2. Index of the Administrative Record

cc: T. Johnson, U.S. EPA, OERR, 5202-G
D. Henne, U.S. Dept. of the Interior
A. Howard, Michigan Dept. of Natural Resources

ENFORCEMENT ADDENDUM

Redacted - not relevant to the selection of the removal action.

ATTACHMENT 1

DETAILED CLEANUP CONTRACTOR COST ESTIMATE
UNION LAKE RADIATION SITE
UNION LAKE, OAKLAND COUNTY, MICHIGAN

MARCH 1995

Personnel and Equipment	$24,000
Disposal/Transportation	11,200
Contingency (20%)	7,040
Total	$42,240

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ATTACHMENT 2

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION

ADMINISTRATIVE RECORD
FOR
UNION LAKE RADIATION SITE
UNION LAKE, OAKLAND COUNTY, MICHIGAN

March 23, 1995

DATES	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
11/10/94	Dykstra, T., Mich. Dept. of Public Health	Thomas, M., Mich. State Police	Letter re: Clinton Twp. Police Dept. Incident #CL-94-03	2
11/24/94	Minaar, D., Mich. Dept. of Public Health	File	Memorandum re: Telephone Conversation with David Hahn and Kathleen Hahn	2
12/20/94	Bruchmann, G., Mich. Dept. of Public Health	Karl, R., U.S. EPA	Letter re: State Request for Removal Assistance	2
00/00/00	Ecology & Environment, Inc.	U.S. EPA	Site Assessment Report (Pending)	
00/00/00	Lall, P. U.S. EPA	Traub, J., U.S. EPA	Action Memorandum (Pending)	